

Participatory Design of Interactive Computer-Based Learning Systems

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INTRODUCTION

We present an iterative evaluation methodology (as part of a participatory design methodology) employed in an online course for learning Modern Greek. Unlike other educational technology evaluation methodologies that focus primarily on questionnaires that administer summative and formative evaluation methods (Kandaswamy, 1990; Scriven, 1980), we propose a hybrid evaluation that is unique in the following ways.

1. It becomes an integral part of all stages of our design methodology, so every stage of the development is based on user feedback and evaluation.
2. In addition to evaluation questionnaires, we also collected feedback from our users through our interaction with the students during our collaborative design and development of the course. The students contributed lecture notes, quizzes, and student diaries that enabled us to evaluate the pedagogical value of our course, ensuring continuous feedback from the students regarding the usability and adequacy of the course.

The purpose of our hybrid formative evaluation is the iterative improvement of the online course through the methodology of participatory design (PD; Ellis, Jankowski, & Jasper, 1998).

The Learn Greek Online course (with currently over 50,000 registered students) includes 104 lessons, the transcribed text of the audio files, corresponding grammar and dictionary notes for each lesson, a Greek-English-Greek dictionary, and a spell-checker. In addition, the course provides an online discussion forum where students post ques-

tions for the administrators, or discuss the classes and learning techniques with other students.

The Learn Greek Online management team's focus from the beginning has been to design an online learning community to increase our users' motivation, commitment, and satisfaction with the online course. The participatory design methodology blends nicely with our goal by involving users during the course development to achieve greater user commitment, acceptance, usage, and satisfaction with the course.

LEARN GREEK ONLINE

The Greek lessons course was developed and hosted by Kypros-Net, Inc., a nonprofit organization that provides information online about the island of Cyprus, including news, history, culture, and so forth. The course includes 105 audio lessons with corresponding notes, a Greek-English-Greek dictionary, and a spell-checker. In addition, a section of the site's discussion board is dedicated to student questions about the course.

The Greek online course content evolved gradually over four years. Based initially on 105 digitized lessons (around 20 minutes each), it gradually developed into a complete Greek language course. The site was designed to encourage student participation in its subsequent development (participatory design).

PARTICIPATORY DESIGN

Participatory design (often termed the "Scandinavian challenge"; Bjerknes, Gro, Pelle, & Morten, 1987) refers to a design approach that focuses on the

intended user of the service or product, and advocates the active involvement of users throughout the design process. User involvement is seen as critical both because users are the experts in the work practices supported by these technologies and because users ultimately will be the ones creating new practices in response to new technologies (Blomberg & Henderson, 1990).

Blomberg and Henderson (1990) characterize the PD approach as advocating three tenets.

1. The goal is to improve the quality of life.
2. The orientation is collaborative.
3. The process is iterative.

Design Approach

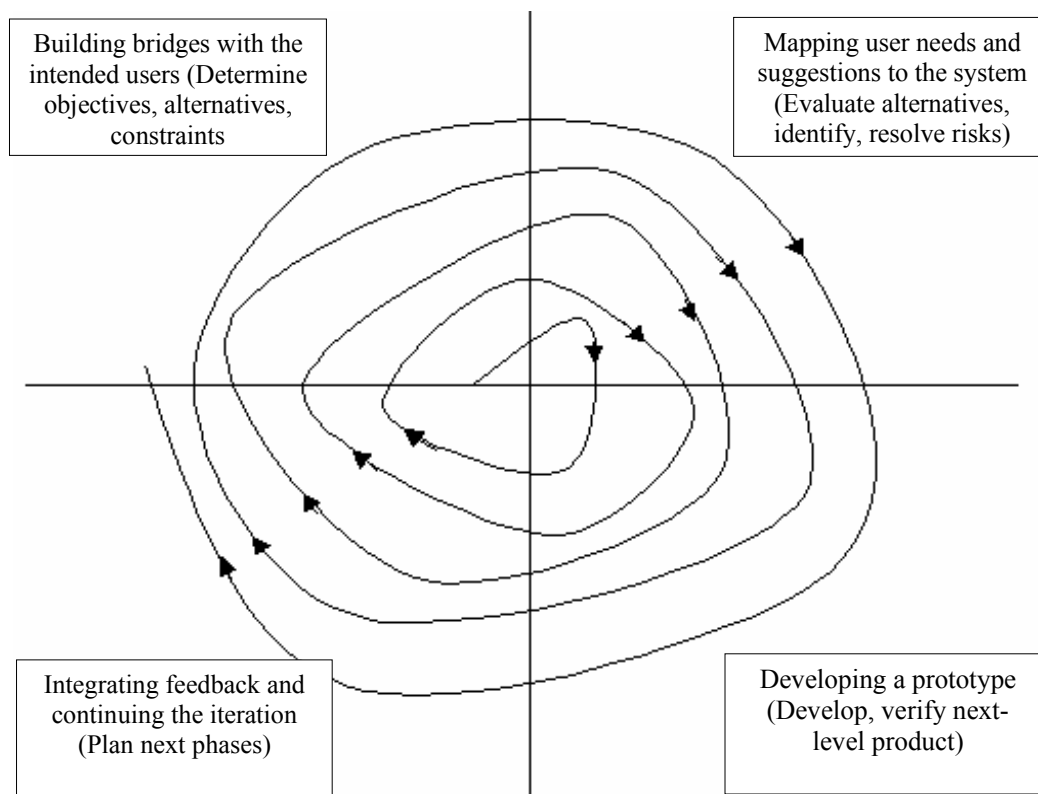
Our development model has been implemented in collaborative participatory design teams (composed of designers from the Kypros-Net team and users-

learners of our course as design partners), which not only enhanced the course content but also played a role in designing and implementing the course evaluation.

Our focus has been to design an online learning community. We believed that this online interaction and community would increase our users' motivation, commitment, and satisfaction with the online course. The PD methodology blends nicely with our goal. In particular, involving users during system development is thought to lead to greater user commitment, acceptance, usage, and satisfaction with the system (Baroudi, Olson, & Ives, 1986).

In the design phase of the online Greek language course, we implemented PD as a four-step process (Blomberg & Henderson, 1990; Ellis et al., 1998; Zaphiris & Zacharia, 2001), with each step corresponding to one of the four levels of the classical spiral software-engineering development model (Boehm, 1998; Figure 1).

Figure 1. The participatory design methodology employed in this project (in parentheses are the corresponding levels of the classical spiral design methodology)



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